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ABSTRACT

The experiment used a repeated measures design to test some hypotheses about the reaction of high school students to simulated jobs. Students explored six divergent jobs in random order and gave their reactions to each job by filling out a standard questionnaire. The results strongly support some revised formulations of Holland's theory of how people react to jobs. The theory assumes people can be characterized according to six personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The environments in which people live can be characterized by their resemblance to six model environments whose categories are the same as those of the personality types. Finally, according to the theory, the pairing of persons and environments leads to predictable and understandable outcomes. The degree of congruency a student experiences between himself and a standard work simaulation usually coincides with the degree of congruency estimated from a theoretical model. The results are statistically significant and substantial for both girls (N = 92) and boys (N = 127). (The questionnaire and data tables are included in the report.) (Author/AG)

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AN EXPERIMENTAL STUDY OF THE REACTION OF HIGH SCHOOL STUDENTS TO SIMULATED JOBS

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Introductory Statement

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through three programs to achieve its objectives. The Schools and Maturity program is studying the effects of school, family, and peer group experiences on the development of attitudes consistent with psychosocial maturity. The objectives are to formulate, assess, and research important educational goals other than traditional academic achievement. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in schools. The Careers and Curricula program bases its work upon a theory of career development. It has developed a self-administered vocational guidance device and a self-directed career program to promote vocational development and to foster satisfying curricular decisions for high school, college, and adult populations.

This report, prepared by the Careers and Curricula program, is part of a project studying person - environment interactions in order to gain more knowledge of how experience effects vocational behavior. This study examines the reactions of high school students to divergent kinds of work.

Abstract

This experiment used a repeated measures design to test some hypotheses about the reaction of high school students to simulated jobs. Students explored six divergent jobs in random order and gave their reactions to each job by filling out a standard questionnaire. The results strongly support some revised formulations of how people react to jobs (Holland, 1973). The degree of congruency a student experiences between himself and a standard work simulation usually coincides with the degree of congruency estimated from a theoretical model. The results are statistically significant and substantial for both girls (N = 92) and boys (N = 127).

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Introduction

This study was performed to acquire a clearer knowledge of people's reactions (perceptions, satisfactions, evaluations, etc.) to divergent kinds of work. The study used Holland's revised theory of careers (Holland, 1973) to specify the assessment of persons and jobs and the reactions of students to jobs.

The importance of understanding person-job or person-environment interactions cannot be overestimated. If we develop a good understanding of such interactions, many practical and potent applications become possible, including how to foster more satisfying vocational decisions, how to redesign jobs for greater personal fulfillment, and how to help people achieve a variety of desirable outcomes.

The present experiment was expected to produce more definitive findings than earlier studies that used an earlier version of the theory and usually produced weak, inconsistent, or negative evidence (Holland, 1966; Walsh, 1973). Likewise, competing theories of explanation for person-environment interaction have also produced mixed and weak findings (Walsh, 1973). It was assumed that the present study would produce more positive and explicit results because it was a rigorous experiment rather than a naturalistic study, and because the guiding theory is assumed to have undergone some felicitous revisions (Holland, 1973).

The revised theory used to orient the experiment is briefly outlined here. See Holland (1973) for a complete account including the relevant research evidence.

The theory consists of several simple ideas and their more complex elaborations. First, we can characterize people by their resemblance to each of six personality types: Realistic, Investigative, Artistic, Social,

Enterprising, and Conventional. Second, the environments in which people live can be characterized by their resemblance to six model environments: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional.

Finally, the pairing of persons and environments leads to outcomes that we can predict and understand from our knowledge of the personality types and the environmental models. These outcomes include vocational choice, vocaticnal stability and achievement, educational choice and achievement, personal competence, social behavior, and susceptibility to influence.

The relationships within and between the types are ordered according to a hexagonal model (Figure 1) in which the distances between the types or environments are inversely proportional to the theoretical relationships between them. This spatial arrangement provides explicit definitions of consistency of the personality type (three levels) and congruence of person and environment (four or more levels). The relationships among all constructs in the theory are defined and organized by this single geometric model.

Insert Figure 1

In the present study, a person's type was his highest score on the Self-Directed Search (SDS), which assesses a person's resemblance to each type. The six environments in the theory are represented by six Krumboltz Work Experience Kits (Science Research Associates, 1970). The reactions of a particular type after experiencing a particular kit were assessed by having students fill out a questionnaire which asks whether or not a student liked the tasks, thought he had the necessary competencies, endorsed the

values expressed in a job, etc.

Within this theoretical context, the present investigation was planned to answer four specific questions:

1. Do different kinds of students (personality types) respond to different kinds of jobs (work experience kits) in different ways?

2. Can the degree of congruency be specified using the hexagonal model? Congruency is defined as the closeness of the relationship between the personality type and the environment as determined by the hexagonal model. For example, a Realistic type should find the Realistic work kit most compatible, and the other kits should be less compatible in order of their distance from Realistic on the hexagon: Investigative and Conventional, Artistic and Enterprising, and Social.

3. Is a student-job pairing more compatible if a student also has a more consistent personality pattern? A personality pattern is consistent if the first and second letters of the SDS profile are adjacent on the hexagon (e.g., RI, IA, AS). For example, although the Conventional students should find the C Kit compatible, they should show degrees of compatibility: a Conventional type whose personality pattern is consistent (CE or CR) should like the C kit most, CS and CI students should like the C kit less, and the CA student should find the C kit most incompatible.

4. Is a compatible student-job pairing more compatible if a student also has a well-differentiated personality pattern (SDS profile)? For example, Enterprising students with well-defined profiles (those who are "strong" E types) should find Enterprising kits more compatible than Enterprising students with flat profiles (those who are less strong E types).

Method

Assessment Devices

Instruments used in this study included: (1) the Self-Directed Search (SDS), to assess a person's personality type. Personality type was used as a factor in the design. (2) the Krumboltz Job Experience Kits, to represent Holland's six model environments, the treatment dimension in this study, and (3) the Perceived Congruency Questionnaire (PCQ), the outcome measure, developed to assess a student's reactions to the work kits.

Self-Directed Search (SDS). The SDS is a self-administered, self-scored, and self-interpreted vocational and educational planning device which was developed from Holland's theory of careers (Holland, 1973). The SDS assesses a person's resemblance to each of the types and provides a three-letter summary code designating the type. In this study, a person's highest summary score (the first letter of the summary code) is his type.

The reliability and validity of the SDS are reported in the test manual (Holland, 1973). Test-retest reliabilities for several samples over different periods of time indicate that the SDS summary scores have substantial to high retest reliability. There is also substantial evidence to show that the SDS provides useful estimates of a person's resemblance to each personality type.

Krumboltz Job Experience Kits. Each kit simulates work experiences for a single occupation. While completing the kit, a person must work out problems that are typical of those encountered in the occupation. In lieu of presenting written or audio-visual occupational information to people, the kits attempt to provide an experience of success and satisfaction based on a problem-solving approach.

The format for each kit is similar. A short introduction to the occupation is presented, then the person is given enough information to complete the work sample successfully using a modified form of programmed instruction. The work sample consists of either one or a series of related problems in which the information acquired is put to use. Questions and answers are given throughout the kit; people may refer back to previous information, and the format emphasizes that the experience is not a test.

Holland occupational codes were assigned to twenty kits (Science Research Associates, 1970), and six kits were chosen to represent each of the model environments: Plumber (Realistic), Medical Technologist (Investigative), Designer (Artistic), Elementary Teacher (Social), Salesperson (Enterprising), and Accountant (Conventional). In each case, an attempt was made to select that kit which appeared most typical of a model environment.

Perceived Congruency Questionnaire (PCQ). The PCQ was developed to measure the degree of congruency a person perceived between the requirements of an occupation and his characteristics.[1] The theory assumes that a person seeks out environments in which preferred roles may be taken on and agreeable problems dealt with, and in which a person may express his skills, abilities, attitudes, and values.

Items in the PCQ were written to conform closely to the theoretical accounts of congruency (Holland, 1973). Six items were written for each of five areas: activities, competencies, interests, values, and personality

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[1] This questionnaire (entitled the Occupational Attitude Questionnaire) is contained in Appendix A.

traits. Three items were phrased positively and three were phrased negatively. The term "occupation" rather than "kit" was used to encourage students to think in terms of the job rather than the work kit alone when responding to items. The pool of 30 items was randomized to create Form A. Then Form B was created by arranging the items in Form A in reverse order.

The item analyses of the Perceived Congruency Questionnaire (PCQ) were done separately for boys and girls. The PCQs for each environment were combined; that is, the PCQs which measured the perceived congruency for the Realistic environment were grouped together as were those for the other five environments. Separate analyses of the PCQ were performed for each environment using the Method of Reciprocal Averages (RAVE) (Torgerson, 1958). A complete account of these analyses is given in Appendix B. These analyses resulted in 24-item and 21-item scales for boys and girls, respectively. The Hoyt internal consistency coefficients range from .95 to .96 for boys and from .94 to .97 for girls.

Sample

Three senior high schools in the Baltimore area participated in the experiment. Schools were selected so that we could obtain both a wide range of student types and a full range of socio-economic status.

Procedures

Administration of SDS. The Self-Directed Search was administered to all tenth and eleventh grade students in three high schools. Four testing sessions of two consecutive forty-five minute class periods were scheduled. School counselors administered the SDS to a small number of subjects who were unable to attend any of the scheduled sessions. In the three schools, 73 to 91% of the boys and 82 to 94% of the girls completed the SDS. In all,

2,933 students took the SDS in this initial testing.

Selection. Three criteria had to be satisfied for a student to be eligible for selection. First, a student had to have completed the SDS. Second, a student had to have no ties between the first and second letter of the SDS summary code. A tie would mean a student resembled two personality types equally and could not be assigned to a single type. Third, a student had to report his father's occupation so that the effects of socio-economic status (SES) or social class could be controlled in the sampling procedures. Duncan's Socio-Economic Status Scale (Reiss, Duncan, Hatt, & North, 1961) was used to estimate a student's SES level.

Stratified random sampling procedures were used to select subjects for the experiment. For each sex, six pools of subjects were formed, each pool corresponding to one of the six personality types. Personality types were determined by the first letter of each subject's SDS summary code. Subjects within each pool of personality type were then divided into high and low SES. A table of random numbers was then used to select subjects from each level of SES within the pools of personality types.

There were enough boys of each personality type to form six pools of subjects (See Table 1). For R, I, A, S, and E personality types, 15 high and 15 low SES subjects were randomly selected. Because there were only seven C boys at the high SES level, all were included in the sample and seven were randomly selected from the low SES level. For girls, there were enough subjects to form pools of I, A, S, and C personality types. For each type, 15 subjects at each level of SES were randomly selected for the experiment. The population of girls included too few R and E subjects to be used in the experiment.

Insert Table 1 About Here

Letters were sent to the selected students inviting them to participate in the next phase of the experiment. The letter explained that participation was voluntary and that the six simulated job experience kits would be administered during the school day. The majority of students agreed to participate (78.7 and 85.0 per cent of the boys and girls).

Administration. School counselors scheduled the students for seven class periods: one for each kit and one for the post-SDS. Each school reserved a room for administering the job kits. Two research assistants were assigned per school and were responsible for administering the kits, the Perceived Congruency Questionnaire (PCQ), and the post-SDS.

Experimental Design. A two factor, fixed-effects design with repeated measures over one dimension was used to test the first hypothesis about a student's perceived congruency. The dependent variable was the PCQ score. The personality type dimension was a blocking variable with six levels for boys (RIASEC) and four levels for girls (IASC). The environmental dimension, over which repeated measures were made, was represented by the Job Experience Kits and existed at six levels for each sex. The kits were administered in random order.

Results

The following sections present the results of the repeated measures, simple main effects, level of congruency, differentiation, and consistency analyses. The hypothesis tested by each analysis is indicated in each section.

The main findings of this experiment are shown in Figures 2 and 3 for boys and girls. For example, Figure 2 shows that Realistic boys found the Realistic Kit (Plumber) most congenial or congruent with their preferred activities, assumed competencies, traits, etc.; other types found the Realistic Kit less satisfying in descending order: Social, Artistic, Enterprising, Investigative, and Conventional types. All of the following analyses are simply attempts to learn whether or not the graphic results in Figures 2 and 3 are statistically significant.

Insert Figures 2 and 3

Repeated Measures Analyses

These analyses were performed to examine two hypotheses: (1) Different types should perceive the congruency of the same environment differentially, and (2) the degree of congruency between a student and an environment should be in the order predicted from the hexagonal model.

Six-by-six and four-by-six repeated measures designs with repeated measures on one dimension were used to analyze the PCQ scores for boys and girls. A repeated measures program was used which uses a least-squares solution for designs with unequal n's and computes Box's chi-square statistics for testing the homogeneity of covariance and equicovariance assumptions of the repeated measures design.

For boys, the Box test for homogeneity of covariance yielded a chi-square value of 138.64 ($df = 105$, $p < .05$). The test statistic for the equicovariance assumption was not significant ($\chi^2_{19} = 16.94$, $p > .05$). Therefore, the homogeneity of covariance assumption for the design was not

met, but the equicovariance assumption was accepted.

Because the homogeneity of covariance assumption was violated, the Geiser and Greenhouse (Kirk, 1968) procedure was used to test the F ratios. This conservative procedure involves adjusting the degrees of freedom for the sources of variation which are within subjects for the repeated measures deisgn.

Interaction effects were of primary importance. The ANOVA results for boys are shown in Table 2, and the F ratio for interaction was significant ($F_{5, 121} = 3.93$, $p < .05$).

Insert Table 2 About Here

The results of the repeated measures analysis of PCQ scores for girls are reported in Table 3. The homogeneity of covariance assumption was met ($\chi^2_{105} = 94.63$, $p > .05$) as was the equicovariance assumption ($\chi^2_{19} = 27.82$, $p > .05$). The ANOVA revealed a significant environment by personality

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Insert Table 3 About Here

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interaction ($F = 4.26$, $df = 15, 440$, $p < .05$), and it was concluded that the interaction between personality type and the environment had a significant effect on perceived congruency for both boys and girls.

Simple Main Effects

Because the interaction effects were statistically significant for boys and girls, tests for simple main effects were conducted. This procedure is equal to testing the over-all significance among means at each level of the experimental design. Among subjects effects were tested at each level of

the environmental dimension. This analysis tested how the same personality types perceived different environments.

For boys, the homogeneity of covariance assumption of the model was violated, so the usual pooled mean-square within-cell error term was not used as the denominator term for the F ratios. Instead, the mean-square within-cell error term at each level of the environment was used as the denominator of each F ratio to test these among subjects effects. The mean-square within-cell error terms for the Realistic, Investigative, Artistic, Social, Enterprising, and Conventional environments were 191.14, 198.85, 207.33, 218.84, 182.51, and 193.76, respectively. The numerator and denominator degrees of freedom for these F ratios in each case were equal to 5 and 121, respectively.

The F ratios in Table 4 for differences among the personality types means were significant ($p < .05$) for the Realistic, Investigative, Enterprising, and Conventional environments. Therefore, the null hypothesis of no mean differences for perceived congruency among the personality types was rejected for the Realistic, Investigative, Enterprising, and Conventional environments but not for the Artistic and Social environments. For boys, it was concluded that within those four environments, personality types differed in their perceived congruency of the environments.

For boys, the within subjects effects were tested at each level of the personality type dimension (See Table 4). This analysis tested how different personality types perceive each environment. The F in each case was significant ($p < .05$).

Insert Table 4 About Here

For girls, the null hypothesis of no mean differences for perceived congruency among the personality types was rejected ($p < .05$) for the Investigative, Social, and Conventional environments, but not for the Realistic, Artistic, and Enterprising environments. The within subjects effects were tested at each level of the personality type dimension and are shown in Table 5. For girls, the null hypothesis of no mean differences

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Insert Table 5 About Here

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in perceived congruency among the six environments was rejected for all personality types. To summarize, there were statistically significant differences in perceived congruency among the six environments for each personality type for girls as well as for boys.

Levels of Congruency

The next analyses were performed to learn if the observed order of the means in Figures 2 and 3 conforms to the hypothesized order. For each personality type and environment, the hexagonal model can be used to define four levels of congruency. An environment would be most congruent (Level 4) for subjects with the corresponding personality type; next most congruent (Level 3) for subjects with personality types which were adjacent on the hexagon to the type of the environment; somewhat incongruent (Level 2) for the subjects with personality types non-adjacent/non-opposite the type of the environment on the hexagon; and very incongruent (Level 1) for subjects with personality types which were opposite the environmental type on the hexagon.

Dunn's multiple comparison procedures (Kirk, 1968) were used to construct a set of three contrasts among personality types for each environment: Level 4 congruency against Level 1 (most congruent versus most incongruent); Level 4 congruency against the average of the means for Level 2 (most congruent versus somewhat incongruent); and Level 4 against the average of the means for Level 3 (most congruent versus somewhat congruent). The means for these four congruency levels for boys and girls are shown in Tables 6 and 7. To preserve a .05 significance level over

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Insert Tables 6 and 7 About Here

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the three tests a .017 significance level for each individual comparison was used.

For boys, the results of the mean contrasts of PCQ scores at each level of environment are reported in Table 8. The d is the value that the

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Insert Table 8 About Here

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difference between the means must exceed to be significant. For all hypotheses at each level of environment the d was based on a non-directional test for 3 contrasts with 120 degrees of freedom. When computing d, the mean-square within-cell error term at each level of the environmental dimension was used.

Most contrasts were statistically significant for five levels of the environment dimension: Realistic, Investigative, Artistic, Enterprising, and Conventional. No statistically significant mean differences were found for contrasts within the Social environment. In addition, the means were

usually in the order predicted by the hexagonal model (See Table 8).

For girls, the analysis of contrasts used four rather than six types. The most congruent personality type for the environment was contrasted with the personality type at the other levels of congruency. However, with two personality types absent the most congruent type was not always at Level 4. For example, in the Realistic environment, there were no congruency Level 4 subjects (Realistic personality type). Therefore, congruency Level 3 means (average means for Investigative and Conventional subjects) were contrasted with congruency Levels 1 and 2 means; and Levels 1 and 2 means were then contrasted with each other.

The results for girls are reported in Table 9. For all hypotheses at each level of environment the d was based on a non-directional test for 3 contrasts with 88 degrees of a freedom at the .05 level of significance. Contrasts were statistically significant for three levels of the environmental dimension:

Insert Table 9 About Here

Investigative, Social, and Conventional. In addition, at each level of congruency, means for the three environments occurred in the order predicted by the hexagon (Table 9). No statistically significant differences were found for contrasts within the Realistic, Artistic, and Enterprising environments.

To summarize, the analyses of mean contrasts show that the <u>degree</u> of congruency between a student and a work kit can be estimated by using the hexagonal model. These results hold for most types and for both boys and girls.

Differentiation Hypothesis

These analyses were planned to learn if more, as opposed to less, differentiated types would perceive their most congruent environment as more congruent. Differentiation was defined as the absolute difference between a student's highest and lowest summary score on the first administration of the Self-Directed Search. Differentiation scores can range from 0 to 15.

The distribution of differentiation scores for boys ranged from 4 to 15 with a median of 11.26, and for girls ranged from 6 to 15 with a median of 12.19. The median was used to classify undifferentiated and differentiated subjects.

To test the differentiation hypothesis, the congruency Level 4 PCQ scores were used as the dependent variable. Congruency Level 4 PCQ scores represented the response by each student to the environment most congruent with his personality type. For example, the PCQ administered following exposure to the Realistic environment was the dependent variable for the Realistic type students, and so forth.

The mean for congruency Level 4 PCQ scores for the 69 undifferentiated boys was 66.58 with a standard deviation of 16.44, while the mean for the 58 differentiated boys was 69.52 with a standard deviation of 11.84 ($t = 1.136$, $df = 125$, $p < .05$). The mean congruency Level PCQ scores for the 50 undifferentiated girls was 64.04 with a standard deviation of 13.38; while the mean for the 42 differentiated girls was 63.60 with a standard deviation of 10.69 ($t = -.174$, $df = -.90$, $p < .05$). It was concluded that there was no difference in perceived congruency between the undifferentiated and differentiated students.

Consistency Hypothesis

These analyses were planned to answer the question: when subjects experience the environment most congruent with their personality type, do consistent students perceive the environment as more congruent than inconsistent students?

Consistency was defined by comparing the first two letters of a student's summary code on the first administration of the Self-Directed Search. If the first two letters were adjacent to each other on the hexagon (Figure 1), then the student had a consistent code. The consistent codes are: RI, RC, IR, IA, AI, AS, SA, SE, ES, EC, CE, and CR (Holland, 1973, p. 22). Any other combination of first two letters for the summary code was considered inconsistent.

The dependent variable was the congruency Level 4 PCQ scores which represented the response for each student to the environment most congruent with personality type. The 67 consistent boys had a mean and standard deviation of 70.55 and 13.91 on the congruency Level 4 PCQ scores, while the 60 inconsistent boys had a mean of 64.98 and standard deviation of 14.78 ($t = 2.186$, $df = 125$, $p < .05$). It was concluded that the consistent boys perceived the environment as more congruent.

For the 47 inconsistent girls the mean was 68.60 and the standard deviation was 8.90, and the 45 consistent girls had a mean and standard deviation of 58.87 and 13.17 on the Level 4 PCQ scores ($t = -4.169$, $df = 90$, $p < .05$). It was concluded that the inconsistent girls had a higher mean for the congruency Level 4 PCQ scores than the consistent girls and therefore perceived the environment most congruent with their personality type as more congruent: the results for girls were opposed to the hypothesis.

Discussion

Generally, the major hypotheses were strongly supported. Different types of students react differentially to different kinds of work kits, and equally important, the magnitude of student reactions is generally in accord with the interactive hypotheses generated by the hexagonal model. An experimental design provided explicit manipulations and controls for both standard treatment and estimates of the effects so that the ambiguities usually present in studies of person-job interactions were not present.

At the same time, the results have some limitations. The N's were too small to test hypotheses about girls who were Realistic and Enterprising types. N's were also too small to give the hypotheses about differentiation exhaustive tests. In addition, the possible tests produced negative findings about differentiation and mixed findings for consistency, and the hypotheses about the differentiation and consistency of the environments were not tested. Such tests would have required a large number of work kits.

The main results are consistent with the results of two closely related studies. Williams (1973) found that a student's perceptions of the congruency between himself and two occupations selected to represent two opposed model environments failed to parallel each level of congruency estimated from the hexagonal model. However, the highest level of congruency was predicted from a student's type six out of six times, and was statistically significant in each instance for a sample of high school boys (i.e. an R boy found the R occupation most congruent, etc.). The results for girls were not significant. The findings for boys are impressive because students were giving their impressions of congruency by reacting only to

occupational titles instead of work kits or actual work experience.

In a longitudinal study, Nafziger, Holland, and Gottfredson (1973) found that a college student's satisfaction with his field of study is positively associated with his perception of congruency with that field. Degrees of satisfaction followed the predicted hexagonal ordering exactly, but the magnitude of the effect was small. Taken together, these three parallel studies support the revised main hypothesis about congruency.

The results are also consistent with many previous studies that used the older either-or model of congruency and the older definitions of personality type (Holland, 1966). For example, Morrow (1971) found that congruence of type and field holds for mathematics majors but not for sociology majors. In a related study, Williams (1967) found that congruent student types are more likely to become compatible college roommates than are incongruent types.

The evidence for and against the congruency hypotheses for other outcomes (satisfaction with college, academic and non-academic achievement) has usually been mixed and weak. Holland (1973) and Walsh (1973) have recently summarized these and other related data.

The specific theoretical implications of the present study are mixed. On the one hand, the revised formulations for assessing congruency of person and environment receive clear support. The hexagonal model is useful for organizing person-environment interactions in this study as well as the relatedness among typological constructs in the same person (Edwards and Whitney, 1972; Crabtree, 1971; Cole and Hanson, 1971). The positive results for the main congruency hypothesis imply that other outcomes--achievement and stability of vocation choice--may also be more predictable and interpretable via the revised theory. On the other hand, the role of personal differentiation and consistency of type in interactions

remains unclear, and the role of differentiation and consistency of the environment was not tested for want of a large sample of work kits. New investigations are needed to fully explore the validity of these secondary hypotheses.

The present study suggests some possibilities for a program of studies for the investigation of simulated careers in a theoretical context. For example, people could be asked to experience typical and deviant careers, careers in opposite-sex jobs only, or a succession of similar jobs. Such experiments would allow us to simulate a variety of career patterns whose characteristics and outcomes we can examine in naturalistic settings only with great difficulty and ambiguity.

The potential practical applications appear to be numerous. Counselors using the SDS or the new form of the SVIB (Campbell, 1973) could estimate the degree of congruency for students considering different occupations and give that information to students. In principle, the same procedure should make it possible to help people of any age consider the degree of congruency for any occupational possibility. Conversely, students or employed people seeking new alternatives could evaluate the degree of incongruency between themselves and their old job and the expected congruency of a new job.

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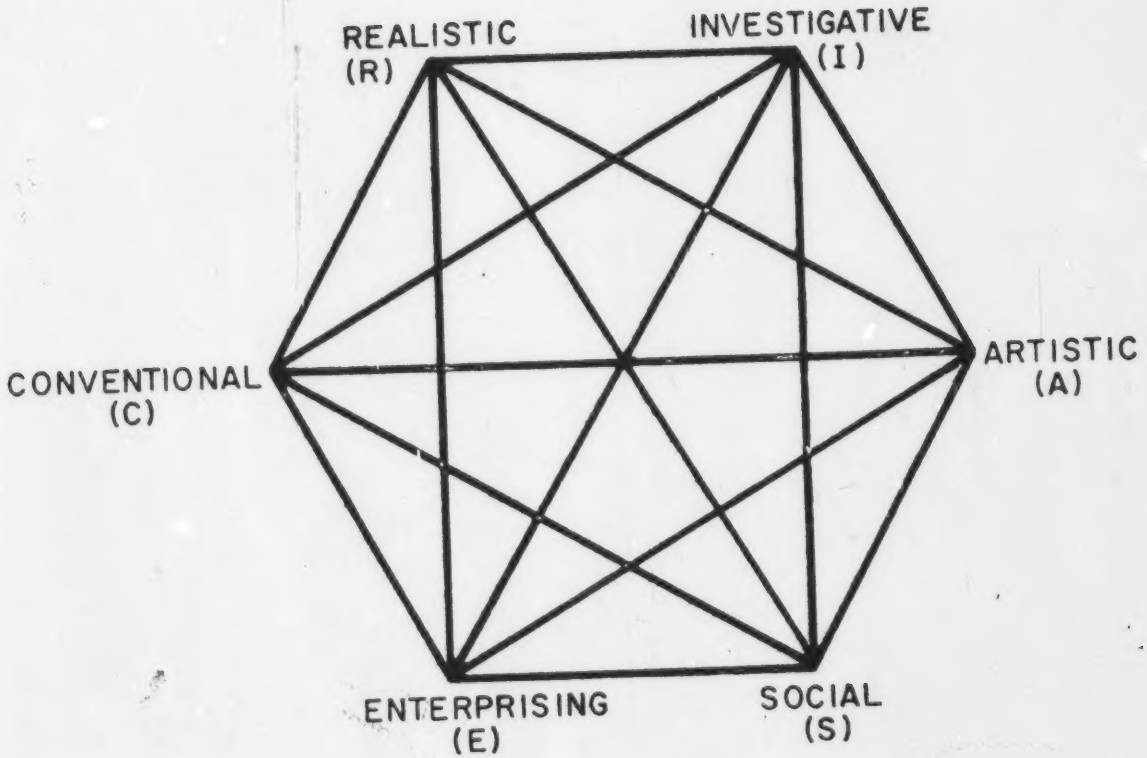

Fig. 1. - Hexagonal Model Representing Interrelationships Among Holland's Six Categories for Personality Types and Model Environments

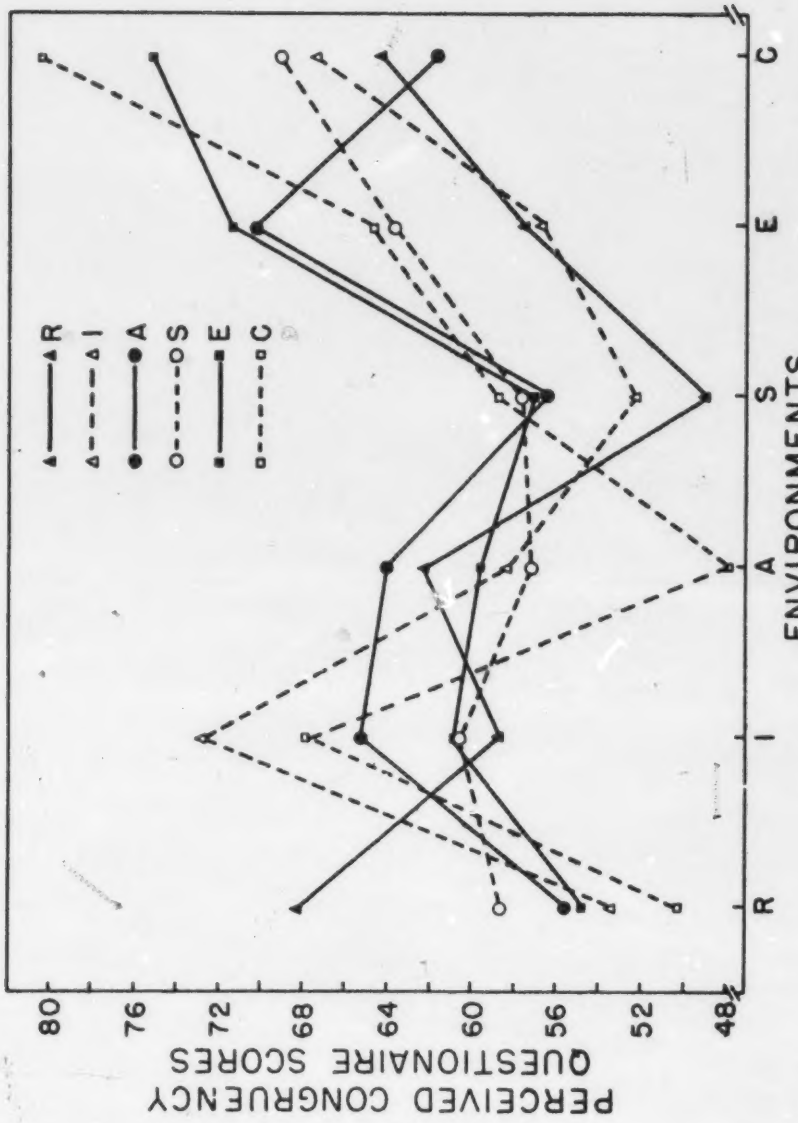

Fig. 2. - Boys' Perceptions of Congruency with Environments (Work Kits)
According to Personality Types (Highest SDS Score)

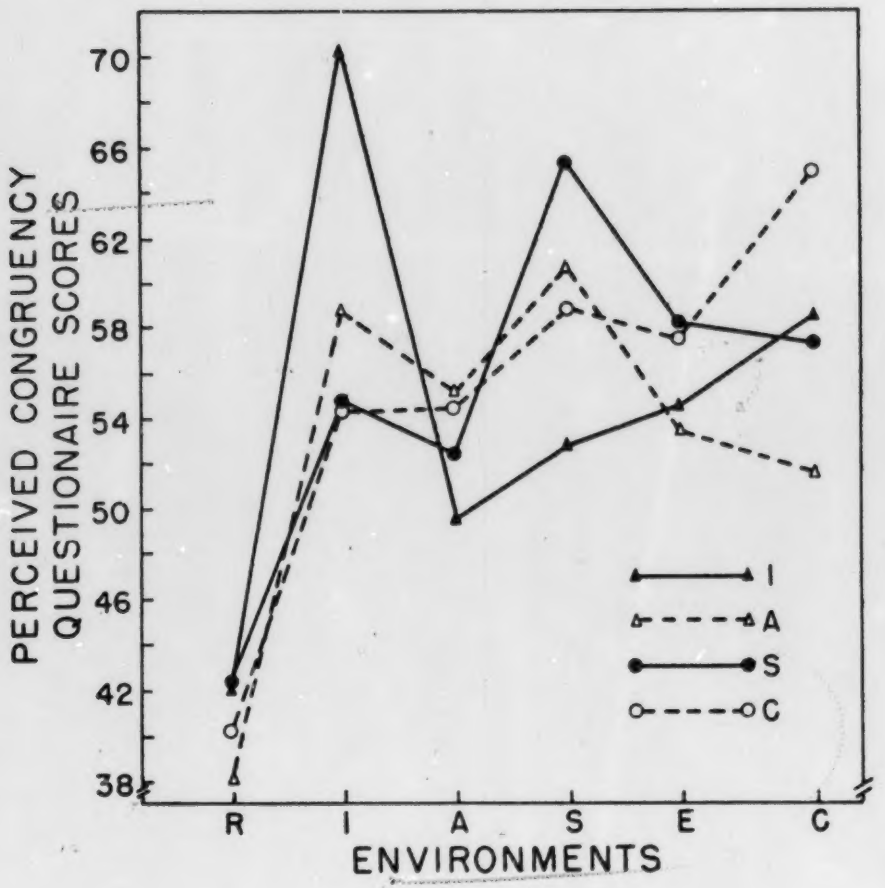

Fig. 3. - Girls' Perceptions of Congruency with Environments (Work Kits) According to Personality Types (Highest SDS Score)

TABLE 1

Number of Students at Various Stages of the Experiment

Personality type	SES level	Subjects: Complete SDS profile	Complete SDS and Complete SES	Complete SDS Complete SES, and no ties	Randomly selected	Completed Experiment: n	Completed Experiment: Mean SES
			Boys				
Realistic	High	634	323	287	15	11	63.5
	Low		255	223	15	12	35.3
Investigative	High	293	96	87	15	11	71.5
	Low		181	167	15	12	32.3
Artistic	High	125	55	50	15	12	72.3
	Low		58	54	15	11	40.6
Social	High	229	109	100	15	12	63.9
	Low		100	94	15	12	31.3
Enterprising	High	84	33	32	15	12	66.3
	Low		45	44	15	11	30.5
Conventional	High	18	7	7	7	6	61.2
	Low		9	9	7	5	33.8
Total		1383	1271	1154	164	127	
			Girls				
Realistic	High	6	4	2	0	-	-
	Low		2	1	0	-	-
Investigative	High	108	32	22	15	14	69.0
	Low		67	53	15	12	33.2
Artistic	High	214	88	70	15	12	68.3
	Low		112	89	15	13	31.4
Social	High	1058	465	436	15	10	69.3
	Low		519	508	15	11	33.3
Enterprising	High	12	4	4	0	-	-
	Low		6	5	0	-	-
Conventional	High	152	82	82	15	10	68.3
	Low		59	59	15	10	31.3
Total		1550	1440	1331	120	92	

TABLE 2

Repeated Measures Analysis of Perceived Congruency Questionnaire Scores for Boys

Source	SS	df	MS	F
Among subjects				
Personality type	965.47	5	193.09	.73
Subjects w. groups	32142.22	121	265.64	
Within subjects				
Environment	16127.22	5	3225.44	17.40*
Environment x personality type	18221.84	25	728.87	3.93*
Environment x subjects w. groups	112142.12	605	185.36	
Total	179598.87	761		

*$p < .05$.

TABLE 3

Repeated Measures Analysis of Perceived Congruency Questionnaire Scores for Girls

Source	SS	df	MS	F
Among subjects				
Personality type	409.66	3	136.55	.64
Subjects w. groups	18785.16	88	213.47	
Within subjects				
Environment	24022.16	5	4804.43	35.95*
Environment x personality type	8534.47	15	568.96	4.26*
Environment x subjects w. groups	58808.22	440	133.66	
Total	110559.66	551		

*$p < .05$.

TABLE 4

Analysis of Simple Main Effects of Perceived Congruency Questionnaire Scores for Boys

Source	SS	df	MS	F[a]
Among subjects				
Personality types in R environment	3904.35	5	780.87	4.09*
Personality types in I environment	3201.26	5	640.25	3.22*
Personality types in A environment	2295.42	5	459.08	2.21
Personality types in S environment	1298.94	5	259.79	1.19
Personality types in E environment	4355.72	5	871.14	4.77*
Personality types in C environment	4131.71	5	826.34	4.26*
Within cell	144284.34	726	198.74	
Within subjects				
Environments for R subjects	4618.32	5	923.66	4.98*
Environments for I subjects	7860.83	5	1572.17	8.48*
Environments for A subjects	3603.51	5	720.70	3.89*
Environments for S subjects	2480.07	5	496.01	2.68*
Environments for E subjects	7715.97	5	1543.19	8.33*
Environments for C subjects	8070.48	5	1614.10	8.71*
Environments x personality type	18221.84	25	728.87	3.93*
Environment x subjects w. groups	112142.12	605	185.36	
Total	179598.87	761		

[a] F ratios for among subjects computed using MS within cell error at each level of environment.

* $p < .05$.

TABLE 5

Analysis of Simple Main Effects of Perceived Congruency Questionnaire Scores for Girls

Source	SS	df	MS	F
Among subjects				
Personality types in R environment	283.89	3	94.63	.64
Personality types in I environment	3931.04	3	1310.35	8.92*
Personality types in A environment	493.60	3	164.53	1.12
Personality types in S environment	1897.16	3	632.39	4.30*
Personality types in E environment	355.67	3	118.56	.81
Personality types in C environment	1982.84	3	660.95	4.50*
Within cell	77593.38	528	146.96	
Within subjects				
Environments for I subjects	11618.06	5	2323.61	17.38*
Environments for A subjects	8100.91	5	1620.18	12.12*
Environments for S subjects	6069.85	5	1213.97	9.08*
Environments for C subjects	6767.84	5	1353.57	10.18*
Environments x personality type	8534.47	15	568.96	4.26*
Environment x subjects w. groups	58808.22	440	113.66	
Total	110559.66	551		

*$p < .05$.

TABLE 6

Mean Perceived Congruency Questionnaire Scores by Levels of Congruency for Each Environment for Boys

Level of Congruency	Environment					
	R	I	A	S	E	C
4	68.17	72.91	64.00	57.71	71.26	80.45
3	51.77	61.90	57.67	56.78	64.27	69.70
2	55.11	64.21	60.92	55.46	63.94	68.18
1	58.63	60.78	47.82	49.83	56.65	61.65

TABLE 7

Mean Perceived Congruency Questionnaire Scores by Levels of Congruency for Each Environment for Girls

Level of congruency	Environment					
	R	I	A	S	E	C
4	-	70.23	55.12	65.29	-	64.90
3	41.12	58.88	50.84	60.68	57.85	-
2	38.04	54.63	-	55.81	53.48	57.84
1	42.33	-	54.40	-	54.50	51.60

TABLE 8

Dunn's Multiple Comparisons of Perceived Congruency Questionnaire Means for Simple Main Effects Among Personality Types at Each Level of Environment for Boys

Environment	Constrasts among levels of congruency	Difference among means	d[a]
Realistic	Level 4 vs. Level 1 (R vs. S)	9.54	9.80
	Level 4 vs. Level 2 (R vs. [A + E]/2)	13.06*	8.57
	Level 4 vs. Level 3 (R vs. [I + C]/2)	16.40*	9.32
Investigative	Level 4 vs. Level 1 (I vs. E)	12.13*	10.05
	Level 4 vs. Level 2 (I vs. [S + C]/2)	8.70	9.51
	Level 4 vs. Level 3 (I vs. [A + R]/2)	11.01*	8.74
Artistic	Level 4 vs. Level 1 (A vs. C)	16.18*	12.81
	Level 4 vs. Level 2 (A vs. [E + R]/2)	3.08	8.92
	Level 4 vs. Level 3 (A vs. [I + S]/2)	6.33	8.85
Social	Level 4 vs. Level 1 (S vs. R)	7.88	10.48
	Level 4 vs. Level 2 (S vs. [I + C]/2)	2.25	9.91
	Level 4 vs. Level 3 (S vs. [A + E]/2)	.93	6.17
Enterprising	Level 4 vs. Level 1 (E vs. I)	14.61*	9.63
	Level 4 vs. Level 2 (E vs. [A + R]/2)	7.32	8.37
	Level 4 vs. Level 3 (E vs. [S + C]/2)	6.99	9.05
Conventional	Level 4 vs. Level 1 (C vs. A)	18.80*	8.69
	Level 4 vs. Level 2 (C vs. [I + S]/2)	12.27*	7.10
	Level 4 vs. Level 3 (C vs. [R + E]/2)	10.75*	7.18

[a] d was based on a non-directional test for 3 contrasts with 120 degrees of freedom at the .05 level.

* $p < .05$.

TABLE 9

Dunn's Multiple Comparisons of Perceived Congruency Questionnaire Means for Simple Main Effects Among Personality Types at Each Level of Environment for Girls

Environment	Contrasts among levels of congruency	Difference among means	d[a]
Realistic	Level 3 vs. Level 1 ([I + C]/2 vs. S)	1.21	7.91
	Level 3 vs. Level 2 ([I + C]/2 vs. A)	3.08	7.46
	Level 2 vs. Level 1 (A vs. S)	4.29	8.81
Investigative	Level 4 vs. Level 2 (I vs [S + C]/2)	15.60*	7.46
	Level 4 vs. Level 3 (I vs. A)	11.35*	5.84
	Level 3 vs. Level 2 (A vs. [S + C]/2)	4.25	7.57
Artistic	Level 4 vs. Level 1 (A vs. C)	.72	8.91
	Level 4 vs. Level 3 (A vs. [I + S]/2)	4.28	7.40
	Level 3 vs. Level 1 ([I + S]/2 vs. C)	3.56	7.97
Social	Level 4 vs. Level 2 (S vs. [I + C]/2)	9.48*	7.91
	Level 4 vs. Level 3 (S vs. A)	4.61	8.81
	Level 3 vs. Level 2 (A vs. [I + C]/2)	4.87	7.46
Enterprising	Level 3 vs. Level 1 ([S + C]/2 vs. I)	3.35	7.46
	Level 3 vs. Level 2 ([S + C]/2 vs. A)	4.37	7.57
	Level 2 vs. Level 1 (A vs. I)	1.02	8.30
Conventional	Level 4 vs. Level 1 (C vs. A)	13.30*	8.91
	Level 4 vs. Level 2 (C vs. [I + S]/2)	7.06	7.97
	Level 2 vs. Level 1 ([I + S]/2 vs. A)	6.24	7.40

[a] d was based on a non-directional test for 3 contrasts with 88 degrees of freedom at the .05 level.

* $p < .05$.

Appendix A

Occupational Attitude Questionnaire
Form A

NAME: _____ _____

OCCUPATION: _____ _____

KITS COMPLETED (Including this one): 1 2 3 4 5 6

Directions. Think of yourself as having tried this occupation for a day. When the day's work is done, someone asks you about your opinions of the experience. To the statements below, circle your amount of agreement or disagreement as follows, 4-Strongly Agree (SA), 3-Agree, but not strongly(A), 2-Disagree, but not strongly (D), 1-Strongly Disagree (SD). Please answer every item.

		SA	A	D	SD
1.	An educational or training program in this occupation would not appeal to me	4	3	2	1
2.	Compared to most people, I think my performance in this job would be below average	4	3	2	1
3.	I would generally feel comfortable in this occupation	4	3	2	1
4.	If someone offered me this job, I would probably take it	4	3	2	1
5.	People in this occupation have skills similar to my own	4	3	2	1
6.	I would find this kind of work frustrating	4	3	2	1
7.	People in this occupation have different value systems from mine	4	3	2	1
8.	My personality is similar to the typical worker in this occupation	4	3	2	1
9.	If I had to work at this occupation I would probably change jobs at the first opportunity	4	3	2	1
10.	I could easily do this kind of work	4	3	2	1
11.	I found the tasks in this occupation boring	4	3	2	1
12.	I think this occupation is close in line with the things I feel are important about work	4	3	2	1

-Continue on back-

		SA	A	D	SD
13.	For me, there would be too much day-to-day stress in this occupation	4	3	2	1
14.	I would like more information about this occupation	4	3	2	1
15.	This occupation is especially important in our society	4	3	2	1
16.	This occupation requires skills I don't really have	4	3	2	1
17.	The tasks in this occupation are the kind I like to solve	4	3	2	1
18.	This occupation would <u>not</u> provide the kinds of rewards I feel are important in one's work	4	3	2	1
19.	After finishing the tasks in this occupation, I wish there had been more to do	4	3	2	1
20.	This occupation requires the kinds of personal qualities I think I have	4	3	2	1
21.	This would be a difficult occupation for me	4	3	2	1
22.	If someone gave me a brochure on this occupation, I probably wouldn't read it	4	3	2	1
23.	I would feel out of place in this occupation	4	3	2	1
24.	If I were to enter this occupation, I think I would be an above-average worker	4	3	2	1
25.	This occupation isn't especially critical to our society	4	3	2	1
26.	This would be an exciting occupation to be working in	4	3	2	1
27.	I really could <u>not</u> get involved with the tasks in this occupation	4	3	2	1
28.	To stay in this occupation, I would have to change a lot of things about myself	4	3	2	1
29.	People in this occupation and I would value many of the same things	4	3	2	1
30.	I would like to train for this occupation	4	3	2	1

Occupational Attitude Questionnaire
Form B

NAME: _____ _____

OCCUPATION: _____ _____

KITS COMPLETED (Including this one): 1 2 3 4 5 6

Directions. Think of yourself as having tried this occupation for a day. When the day's work is done, someone asks you about your opinions of the experience. To the statements below, circle your amount of agreement or disagreement as follows, 4-Strongly Agree (SA), 3-Agree, but not strongly (A), 2-Disagree, but not strongly (D), 1-Strongly Disagree (SD). Please answer every item.

		SA	A	D	SD
1.	I would like to train for this occupation	4	3	2	1
2.	People in this occupation and I would value many of the same things	4	3	2	1
3.	To stay in this occupation, I would have to change a lot of things about myself	4	3	2	1
4.	I really could not get involved with the tasks in this occupation	4	3	2	1
5.	This would be an exciting occupation to be working in	4	3	2	1
6.	This occupation isn't especially critical to our society	4	3	2	1
7.	If I were to enter this occupation, I think I would be an above-average worker	4	3	2	1
8.	I would feel out of place in this occupation	4	3	2	1
9.	If someone gave me a brochure on this occupation, I probably wouldn't read it	4	3	2	1
10.	This would be a difficult occupation for me	4	3	2	1
11.	This occupation requires the kinds of personal qualities I think I have	4	3	2	1
12.	After finishing the tasks in this occupation, I wish there had been more to do	4	3	2	1

-Continue on back-

		SA	A	D	SD
13.	This occupation would not provide the kinds of rewards I feel are important in one's work	4	3	2	1
14.	The tasks in this occupation are the kind I like to solve	4	3	2	1
15.	This occupation requires skills I don't really have	4	3	2	1
16.	This occupation is especially important in our society	4	3	2	1
17.	I would like more information about this occupation	4	3	2	1
18.	For me, there would be too much day-to-day stress in this occupation	4	3	2	1
19.	I think this occupation is close in line with the things I feel are important about work	4	3	2	1
20.	I found the tasks in this occupation boring	4	3	2	1
21.	I could easily do this kind of work	4	3	2	1
22.	If I had to work at this occupation I would probably change jobs at the first opportunity	4	3	2	1
23.	My personality is similar to the typical worker in this occupation	4	3	2	1
24.	People in this occupation have different value systems from mine	4	3	2	1
25.	I would find this kind of work frustrating	4	3	2	1
26.	People in this occupation have skills similar to my own	4	3	2	1
27.	If someone offered me this job, I would probably take it	4	3	2	1
28.	I would generally feel comfortable in this occupation	4	3	2	1
29.	Compared to most people, I think my performance in this job would be below average	4	3	2	1
30.	An educational or training program in this occupation would not appeal to me	4	3	2	1

Appendix B

ITEM ANALYSIS OF THE PCQ

The item analysis of the Perceived Congruency Questionnaire (PCQ) was done separately for boys and girls. The PCQs were combined according to environments; that is, the PCQs which measured the perceived congruency for the Realistic environment were grouped together as were those for the other five environments. Each group of PCQs was analyzed separately by the Method of Reciprocal Averages (RAVE) (Torgerson, 1958). The six RAVE analyses by environment were a quasi-crossvalidation of the items using the same sample. When grouped by environments, the PCQs were 6 independent measures on the experimental subjects.

The first step in the RAVE item analysis was to eliminate items in the PCQ which did not have a linear relationship with the total score for each environment. An a priori weighting scheme of 1,2,3, or 4 was assigned to the item responses. A weight of 1 represented the lowest degree of perceived congruency and 4 the highest degree so that high total scores indicate high perceived congruency. The derived weights for items 8, 10, 15, 17, 19, and 25 for boys and 1, 2, 3, 9, 10, 12, 15, 20, and 25 for girls were reversed in at least one environment. The non-linear weighting patterns indicated that these items had poor discriminatory power; these items were eliminated. The eliminated items had poor discriminatory power primarily in the Social environment for boys and in the Realistic environment for girls.

The remaining twenty-four items for boys and twenty-one items for girls were submitted to a second analysis using the same 1, 2, 3, or 4 weights.

No reversals of the derived item weights appeared for either boys or girls. The Hoyt internal consistency coefficients range from .95 to .96 for boys and from .94 to .97 for girls. The linear pattern of weights and the Hoyt coefficients provided strong evidence to support the scalability of the items and the unidimensionality of the PCQ.

A final item weighting scheme had to be determined. In a repeated measures design the criterion must be the same each time a measurement is taken. Therefore, this required that response categories for each item be weighted the same regardless of the environment. The majority of derived RAVE weights for the twenty-four items for boys and the twenty-one items for girls were in the expected pattern of 1, 2, 3, or 4 for strongly disagree, disagree, agree, strongly agree. Those items with different derived RAVE weights in some environments did not deviate markedly from the 1, 2, 3, or 4 pattern. The decision was made to use item weights of 1, 2, 3, or 4 for all items retained.

A total score on the PCQ equaled the sum of item responses. The lowest congruency score for boys could be 24 and for girls 21; the highest congruency score for boys could be 96 and for girls 84. After the total scores on the PCQs were computed, other item characteristics were also examined by sex and environment. The response frequencies for each item category, the item means and standard deviations, range and median of inter-item correlations, and correlations between an item and total score with the item excluded are reported in the following tables.

APPENDIX B

Derived RAVE Weights and Hoyt Reliability Coefficients with Standard Errors for 30-Item Perceived Congruency Questionnaire for Boys in Each Environment

	Environment					
Item	R	I	A	S	E	C
1						2234
2	1134				1134	
3			1244			
4				1244		1134
5						
6						
7				1233		
8			1244	1241		2234
9			1233			
10				1243		
11		1134				
12			1233	1233		
13			1233			1134
14	1244		1244	1244		
15	1233	1233		2123		
16			1233			1134
17			1244	1243		1134
18				1233		
19	1244			1343		
20		1244		1244		
21						2234
22						
23						
24			1233			
25	2323	3223	1233	3223	2233	2234
26			1244	1244		
27						
28						
29						
30		1244	1244	1344	1244	
Hoyt	.96	.96	.96	.96	.96	.96
SE	3.52	3.47	3.65	3.70	3.31	3.28

Note: No entry indicates RAVE weights were 1234; underlining indicates reversal of weights.

APPENDIX B

Derived RAVE Weights and Hoyt Reliability Coefficients with Standard Errors for 30-Item Perceived Congruency Questionnaire for Girls in Each Environment

	Environment					
Item	R	I	A	S	E	C
1	1343					1244
2	1232		1134	2234	2234	
3	1243					
4	1344					
5	1240	1244				
6	1233			1134		
7	1233					
8	1244			1244		
9	1242	1134		2234		
10	1243					
11	1233			1134		1134
12	1230					1243
13	1230	1134				
14	1244				1244	
15	0222	2133	1224	0223	2233	1233
16	1244				1134	
17	1340					
18						
19	1334					
20	1343			1134	1134	
21	1233				1134	
22	1233	2234		2234		
23	1244			1134		
24	1244	1334			2234	
25	2122	1223	3234	2233	1233	2233
26	1344					
27	1244			1134		
28						
29	1233	2234				
30	1344	1244			1244	1244
Hoyt	.96	.97	.97	.96	.96	.96
SE	3.85	3.32	3.14	3.42	3.43	3.50

Note: No entry indicates RAVE weights were 1234; underlining indicates reversal of weights.

APPENDIX B

Derived RAVE Weights and Hoyt Reliability Coefficients with Standard Errors for 24-Item Perceived Congruency Questionnaire for Boys in Each Environment

	Environment					
Item	R	I	A	S	E	C
1						2234
2						
3						
4						
5						
6						
7				1233		
9						
11						
12			1233	1233		
13			1233			1134
14			1244	1244		
16						1134
18		1233		1233		
20		1244		1244		
21						2234
22						
23						
24			1233			
26			1244	1244		
27						
28						
29				1233		
30			1244	1244		
Hoyt	.96	.96	.95	.96	.96	.96
SE	2.99	3.02	3.18	3.09	2.84	2.82

Note: No entry indicates RAVE weights were 1234.

APPENDIX B

Derived RAVE Weights and Hoyt Reliability Coefficients with Standard Errors for 21-Item Perceived Congruency Questionnaire for Girls in Each Environment

	Environment					
Item	R	I	A	S	E	C
4	1334					
5	1240					
6	1233					
7	1233				1233	
8	1244					
11	1233			1134		
13	1230	1134				
14	1244					
16	1244					
17	1240					
18						
19						
21	1233				1134	
22	1233	2234		2234		
23				1134		
24	1244				2234	
26	1244					
27	1244					
28				2234		
29	1233					
30	2344				1244	
Hoyt	.94	.97	.95	.95	.94	.95
SE	2.98	2.68	2.59	2.71	2.76	2.74

Note: No entry indicates RAVE weights were 1234.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Boys in the Realistic Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	23	43	44	15	2.39	.93	.70
2	13	38	57	19	2.65	.86	.62
3	25	52	42	8	2.26	.85	.81
4	29	45	43	10	2.27	.90	.77
5	23	57	41	6	2.24	.80	.68
6	16	42	52	17	2.55	.88	.77
7	16	49	51	11	2.45	.82	.65
8	-	-	-	-	-	-	-
9	24	42	46	15	2.41	.93	.78
10	-	-	-	-	-	-	-
11	16	35	56	20	2.63	.90	.67
12	19	49	50	9	2.39	.83	.70
13	14	41	55	17	2.59	.86	.71
14	26	53	40	8	2.24	.85	.79
15	-	-	-	-	-	-	-
16	12	49	54	12	2.52	.80	.66
17	-	-	-	-	-	-	-
18	20	45	48	14	2.44	.89	.63
19	-	-	-	-	-	-	-
20	18	58	45	6	2.31	.77	.74
21	19	46	52	10	2.42	.84	.71
22	18	34	55	20	2.61	.92	.62
23	27	43	45	12	2.33	.92	.77
24	16	52	48	11	2.43	.82	.68
25	-	-	-	-	-	-	-
26	29	56	34	8	2.17	.85	.73
27	25	43	47	12	2.36	.91	.71
28	24	46	43	14	2.37	.92	.64
29	18	62	40	7	2.28	.78	.67
30	33	53	34	7	2.12	.86	.79

Note: Inter-item median correlation = .48; range from .21 - .78.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Boys in the Investigative Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	13	39	52	23	2.67	.89	.75
2	6	31	61	29	2.89	.81	.70
3	13	39	59	16	2.61	.84	.78
4	14	39	55	19	2.62	.87	.82
5	14	49	53	11	2.48	.81	.69
6	14	21	62	30	2.85	.91	.67
7	14	48	52	13	2.50	.82	.62
8	-	-	-	-	-	-	-
9	15	24	64	24	2.76	.89	.76
10	-	-	-	-	-	-	-
11	12	18	56	41	2.99	.92	.68
12	10	38	58	21	2.71	.84	.71
13	15	26	66	20	2.72	.87	.69
14	16	45	47	19	2.54	.90	.81
15	-	-	-	-	-	-	-
16	16	42	55	14	2.53	.85	.66
17	-	-	-	-	-	-	-
18	4	26	60	37	3.02	.79	.52
19	-	-	-	-	-	-	-
20	17	41	63	6	2.46	.78	.79
21	14	31	59	23	2.72	.89	.75
22	13	28	56	30	2.81	.91	.55
23	13	36	52	26	2.72	.91	.75
24	16	40	58	13	2.54	.84	.79
25	-	-	-	-	-	-	-
26	12	40	54	21	2.66	.87	.73
27	16	37	51	23	2.64	.92	.72
28	19	44	48	16	2.48	.90	.73
29	9	48	58	12	2.57	.76	.62
30	17	51	44	15	2.45	.87	.77

Note: Inter-item median correlation = .49; range from .14 - .74.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Boys in the Artistic Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	26	37	53	11	2.39	.91	.73
2	13	34	61	19	2.68	.85	.66
3	22	51	49	5	2.29	.80	.82
4	22	41	51	13	2.43	.90	.75
5	23	45	49	10	2.36	.87	.67
6	21	29	61	16	2.57	.91	.73
7	15	52	49	11	2.44	.81	.64
8	-	-	-	-	-	-	-
9	17	39	52	19	2.57	.90	.67
10	-	-	-	-	-	-	-
11	21	28	54	24	2.64	.97	.72
12	14	51	51	11	2.46	.80	.58
13	8	32	68	19	2.77	.78	.56
14	27	50	38	12	2.28	.91	.78
15	-	-	-	-	-	-	-
16	17	45	51	14	2.49	.86	.67
17	-	-	-	-	-	-	-
18	18	43	50	16	2.50	.89	.61
19	-	-	-	-	-	-	-
20	17	51	50	9	2.40	.81	.75
21	19	33	62	13	2.54	.87	.67
22	18	35	43	31	2.69	1.00	.67
23	21	43	50	13	2.43	.89	.75
24	20	45	51	11	2.42	.86	.66
25	-	-	-	-	-	-	-
26	24	50	41	12	2.32	.89	.72
27	19	39	53	16	2.52	.90	.78
28	24	46	43	14	2.37	.92	.65
29	22	43	54	8	2.38	.84	.76
30	32	48	38	9	2.19	.90	.80

Note: Inter-item median correlation = .47; range from .22 - .73.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Boys in the Social Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	33	47	34	13	2.21	.95	.66
2	18	40	61	8	2.46	.81	.67
3	33	45	37	12	2.22	.94	.81
4	42	43	30	12	2.09	.97	.78
5	28	53	43	3	2.17	.79	.73
6	27	33	51	16	2.44	.96	.72
7	17	52	54	4	2.35	.75	.62
8	-	-	-	-	-	-	-
9	31	42	44	10	2.26	.92	.77
10	-	-	-	-	-	-	-
11	22	32	52	21	2.57	.96	.77
12	17	44	52	14	2.50	.86	.62
13	23	46	49	9	2.35	.86	.66
14	32	64	26	5	2.03	.79	.75
15	-	-	-	-	-	-	-
16	23	51	46	7	2.29	.83	.68
17	-	-	-	-	-	-	-
18	15	37	52	23	2.65	.91	.60
19	-	-	-	-	-	-	-
20	20	62	43	2	2.21	.72	.77
21	20	47	50	10	2.39	.85	.76
22	28	39	40	20	2.41	1.00	.71
23	34	43	44	6	2.17	.88	.75
24	17	61	43	6	2.30	.76	.70
25	-	-	-	-	-	-	-
26	29	59	31	8	2.14	.84	.77
27	23	49	40	15	2.37	.92	.74
28	26	56	38	7	2.20	.83	.66
29	25	49	46	7	2.28	.84	.71
30	38	61	25	3	1.94	.77	.76

Note: Inter-item median correlation = .50; range from .22 - .72.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Boys in the Enterprising Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total r[b]
	1	2	3	4			
1	17	34	55	21	2.63	.92	.67
2	7	24	67	29	2.93	.80	.71
3	14	44	55	14	2.54	.83	.82
4	14	29	60	24	2.74	.89	.74
5	8	52	58	9	2.54	.72	.72
6	13	29	61	24	2.76	.88	.71
7	7	46	64	10	2.61	.71	.62
8	-	-	-	-	-	-	-
9	12	36	54	25	2.72	.89	.73
10	-	-	-	-	-	-	-
11	9	26	62	30	2.89	.85	.65
12	13	46	57	11	2.52	.80	.77
13	15	33	65	14	2.61	.84	.74
14	15	50	43	19	2.52	.89	.78
15	-	-	-	-	-	-	-
16	10	29	71	17	2.75	.79	.64
17	-	-	-	-	-	-	-
18	15	39	55	18	2.60	.87	.73
19	-	-	-	-	-	-	-
20	9	40	62	16	2.67	.79	.81
21	11	26	66	24	2.81	.84	.71
22	13	26	58	30	2.83	.91	.69
23	12	31	59	25	2.76	.88	.76
24	6	44	60	17	2.69	.76	.64
25	-	-	-	-	-	-	-
26	17	46	43	21	2.54	.92	.84
27	15	35	60	17	2.62	.86	.63
28	11	42	60	14	2.61	.80	.69
29	7	47	61	12	2.61	.74	.74
30	15	53	42	17	2.48	.87	.78

Note: Inter-item median correlation = .49; range from .24 - .76.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Boys in the Conventional Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	13	32	50	32	2.80	.94	.58
2	5	16	72	34	3.06	.74	.61
3	11	25	67	24	2.82	.84	.81
4	11	20	58	38	2.97	.90	.83
5	5	39	67	16	2.74	.73	.77
6	11	21	61	34	2.93	.88	.82
7	6	38	71	12	2.70	.71	.74
8	-	-	-	-	-	-	-
9	12	20	60	35	2.93	.90	.83
10	-	-	-	-	-	-	-
11	7	17	60	43	3.09	.83	.74
12	8	34	61	24	2.80	.82	.68
13	5	29	73	20	2.85	.72	.76
14	13	24	58	32	2.86	.91	.80
15	-	-	-	-	-	-	-
16	6	23	70	28	2.94	.77	.70
17	-	-	-	-	-	-	-
18	7	30	63	27	2.87	.81	.71
19	-	-	-	-	-	-	-
20	7	33	64	23	2.81	.79	.76
21	9	25	62	31	2.91	.85	.61
22	11	19	48	49	3.06	.94	.71
23	14	28	58	27	2.77	.91	.77
24	7	30	66	24	2.84	.79	.63
25	-	-	-	-	-	-	-
26	15	28	60	24	2.73	.90	.81
27	9	25	59	34	2.93	.87	.73
28	10	35	62	20	2.72	.82	.72
29	6	38	63	20	2.76	.77	.71
30	14	33	55	25	2.72	.91	.84

Note: Inter-item median correlation = .52; range from .15 - .75.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Girls in the Realistic Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	45	33	10	4	1.71	.83	.72
5	34	39	19	0	1.84	.75	.75
6	33	32	17	10	2.04	.99	.66
7	19	39	29	5	2.22	.84	.64
8	26	55	8	3	1.87	.70	.63
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	20	31	29	12	2.36	.97	.62
12	-	-	-	-	-	-	-
13	22	43	27	0	2.05	.73	.64
14	40	39	11	2	1.73	.76	.71
15	-	-	-	-	-	-	-
16	31	44	15	2	1.87	.76	.70
17	36	41	15	0	1.77	.71	.71
18	20	41	25	6	2.18	.85	.56
19	34	45	11	2	1.79	.73	.69
20	-	-	-	-	-	-	-
21	32	32	26	2	1.98	.85	.78
22	33	29	16	14	2.12	1.07	.69
23	38	34	14	6	1.87	.90	.77
24	36	41	13	2	1.79	.76	.74
25	-	-	-	-	-	-	-
26	34	44	10	4	1.83	.79	.71
27	33	40	11	8	1.93	.91	.75
28	28	38	21	5	2.03	.87	.67
29	20	51	15	6	2.08	.80	.48
30	52	31	7	2	1.55	.73	.66

Note: Inter-item median correlation = .43 range from .04 - .78.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Girls in the Investigative Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	10	19	38	25	2.85	.95	.82
5	8	28	42	14	2.67	.84	.72
6	9	15	45	23	2.89	.90	.74
7	7	26	35	24	2.83	.91	.77
8	5	24	47	16	2.80	.79	.67
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	6	14	35	37	3.12	.90	.76
12	-	-	-	-	-	-	-
13	5	20	46	21	2.90	.81	.76
14	12	19	36	25	2.80	.99	.82
15	-	-	-	-	-	-	-
16	16	19	42	15	2.61	.96	.77
17	6	24	39	23	2.86	.87	.85
18	2	12	38	40	3.26	.77	.60
19	9	22	34	27	2.86	.96	.84
20	-	-	-	-	-	-	-
21	6	21	44	21	2.87	.84	.74
22	10	16	28	38	3.02	1.02	.65
23	11	12	44	25	2.90	.94	.78
24	6	31	41	14	2.68	.81	.74
25	-	-	-	-	-	-	-
26	7	16	39	30	3.00	.90	.76
27	10	18	33	31	2.92	.99	.86
28	7	25	39	21	2.80	.88	.79
29	4	24	45	19	2.86	.79	.77
30	14	22	36	20	2.67	.98	.90

Note: Inter-item median correlation = .57; range from .26 - .81.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Girls in the Artistic Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	12	37	28	15	2.50	.92	.76
5	8	41	35	8	2.47	.78	.70
6	10	25	46	11	2.63	.83	.72
7	8	32	43	9	2.58	.79	.65
8	6	47	33	6	2.42	.71	.74
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	6	30	35	21	2.77	.88	.77
12	-	-	-	-	-	-	-
13	8	31	46	7	2.57	.76	.71
14	11	35	36	10	2.49	.85	.76
15	-	-	-	-	-	-	-
16	10	32	42	8	2.52	.80	.70
17	12	40	34	6	2.37	.79	.80
18	12	30	40	10	2.52	.86	.64
19	10	45	33	4	2.34	.73	.75
20	-	-	-	-	-	-	-
21	12	25	45	10	2.58	.85	.77
22	8	28	38	18	2.72	.88	.60
23	10	33	36	13	2.57	.87	.87
24	14	41	34	3	2.28	.76	.68
25	-	-	-	-	-	-	-
26	8	42	30	12	2.50	.83	.80
27	12	35	35	10	2.47	.86	.77
28	10	33	41	8	2.51	.81	.64
29	5	39	43	5	2.52	.69	.69
30	17	35	28	12	2.38	.94	.75

Note: Inter-item median correlation = .50; range from .20 - .77.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Girls in the Social Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total r[b]
	1	2	3	4			
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	11	25	39	17	2.67	.92	.79
5	8	27	50	7	2.61	.76	.80
6	7	17	44	24	2.92	.87	.78
7	6	25	42	19	2.80	.84	.63
8	6	30	44	12	2.67	.79	.72
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	4	14	40	34	3.13	.83	.68
12	-	-	-	-	-	-	-
13	9	23	42	18	2.75	.88	.71
14	8	31	41	12	2.62	.82	.70
15	-	-	-	-	-	-	-
16	7	17	50	18	2.86	.82	.69
17	4	26	47	15	2.79	.76	.86
18	3	16	38	35	3.14	.82	.69
19	8	35	38	11	2.57	.82	.74
20	-	-	-	-	-	-	-
21	5	19	47	21	2.91	.81	.58
22	7	18	39	28	2.96	.90	.58
23	2	21	44	25	3.00	.77	.72
24	5	33	42	12	2.66	.77	.75
25	-	-	-	-	-	-	-
26	5	25	35	27	2.91	.89	.86
27	2	24	38	28	3.00	.81	.73
28	8	24	42	18	2.76	.87	.60
29	3	28	42	19	2.84	.79	.81
30	12	35	31	14	2.51	.91	.71

Note: Inter-item median correlation = .49; range from .16 - .78.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Girls in the Enterprising Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	10	27	41	14	2.64	.87	.78
5	4	29	52	7	2.67	.68	.70
6	7	23	46	16	2.77	.83	.69
7	8	24	51	9	2.66	.77	.48
8	9	34	40	9	2.53	.80	.67
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	7	20	44	21	2.86	.86	.68
12	-	-	-	-	-	-	-
13	7	28	47	10	2.65	.78	.64
14	11	36	38	7	2.45	.80	.72
15	-	-	-	-	-	-	-
16	4	21	55	12	2.82	.71	.58
17	6	34	42	10	2.61	.77	.81
18	10	30	42	10	2.57	.83	.69
19	8	39	36	9	2.50	.79	.69
20	-	-	-	-	-	-	-
21	5	22	49	16	2.83	.78	.67
22	6	25	36	25	2.87	.89	.70
23	6	28	42	16	2.74	.82	.66
24	7	28	46	11	2.66	.79	.50
25	-	-	-	-	-	-	-
26	8	30	42	12	2.63	.82	.78
27	6	41	32	13	2.57	.82	.75
28	5	32	40	15	2.71	.81	.71
29	7	30	48	7	2.60	.74	.71
30	14	36	34	8	2.39	.85	.77

Note: Inter-item median correlation = .45; range from .01 - .79.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.

APPENDIX B

Perceived Congruency Questionnaire Item Data for Girls in the Conventional Environment

Item	Response frequency[a]				$\bar{X}$	SD	Item-total
	1	2	3	4			r[b]
1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	5	35	37	15	2.67	.81	.69
5	8	26	49	9	2.64	.78	.48
6	7	20	42	23	2.88	.88	.81
7	8	21	48	15	2.76	.83	.59
8	8	35	40	9	2.54	.79	.63
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	4	17	43	28	3.03	.82	.77
12	-	-	-	-	-	-	-
13	7	24	46	15	2.75	.82	.74
14	12	26	38	16	2.63	.92	.81
15	-	-	-	-	-	-	-
16	5	21	46	20	2.88	.81	.67
17	8	22	43	19	2.79	.87	.84
18	11	24	35	22	2.74	.96	.74
19	9	23	43	17	2.74	.88	.73
20	-	-	-	-	-	-	-
21	5	20	45	22	2.91	.82	.55
22	5	22	38	27	2.95	.87	.71
23	9	24	43	16	2.72	.87	.79
24	5	30	47	10	2.67	.74	.62
25	-	-	-	-	-	-	-
26	10	32	32	18	2.63	.92	.72
27	6	26	37	23	2.84	.88	.76
28	5	24	48	15	2.79	.78	.75
29	5	28	51	8	2.67	.71	.64
30	16	31	32	13	2.46	.94	.77

Note: Inter-item median correlation = .49; range from .15 - .76.

[a] A response of 1 represented the lowest level and 4 the highest level of congruency.

[b] Total score equaled sum of responses to items when weighted 1234; correlations are between an item and total score with that item excluded.